Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL QUALITY MEASURES CLEARINGHOUSE

General

Title

Outpatient chemotherapy: hospital-level, risk-adjusted rates of inpatient admissions or ED visits for cancer patients greater than or equal to 18 years of age for at least one of the following ten diagnoses—anemia, dehydration, diarrhea, emesis, fever, nausea, neutropenia, pain, pneumonia, or sepsis—within 30 days of hospital-based outpatient chemotherapy treatment.

Source(s)

Centers for Medicare and Medicaid Services (CMS). Hospital outpatient quality reporting specifications manual, version 11.0. Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); Effective 2018 Jan. various p.

Measure Domain

Primary Measure Domain

Related Health Care Delivery Measures: Use of Services

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess hospital-level, risk-adjusted rates of inpatient admissions or emergency department (ED) visits for cancer patients greater than or equal to 18 years of age for at least one of the following ten diagnoses—anemia, dehydration, diarrhea, emesis, fever, nausea, neutropenia, pain, pneumonia, or sepsis—within 30 days of hospital-based outpatient chemotherapy treatment. Rates of admission and ED visits are calculated and reported separately.

This measure will be publically reported in both the Outpatient Quality Reporting Program and Prospective Payment System-Exempt Cancer Hospital Quality Reporting (PCHQR) program.

Rationale

Chemotherapy treatment can have severe, predictable side effects, which, if inappropriately managed, can reduce patients' quality of life and increase healthcare utilization and costs. This measure aims to assess the care provided to cancer patients and encourage quality improvement efforts to reduce the number of potentially avoidable inpatient admissions and emergency department (ED) visits among cancer patients receiving chemotherapy in a hospital outpatient setting. Improved management of these potentially preventable clinical conditions that are frequent side effects of chemotherapy treatment—including anemia, dehydration, diarrhea, emesis, fever, nausea, neutropenia, pain, pneumonia, or sepsis—could reduce admissions and ED visits and increase patients' quality of care and quality of life (Hassett et al., 2006; Fitch & Pyenson, 2010; Guillory & Sockdale, 2013). This measure encourages hospitals to use guidelines from the American Society of Clinical Oncology, National Comprehensive Cancer Network, Oncology Nursing Society, Infectious Diseases Society of America, and other professional societies to integrate and promote use of evidence-based interventions to prevent and treat common side effects and complications of chemotherapy.

This risk-standardized measure seeks to increase transparency in the quality of care cancer patients receive and to provide information to help physicians and hospitals mitigate patients' need for acute care, which can be a burden on patients, and increase patients' quality of life.

Evidence for Rationale

Centers for Medicare and Medicaid Services (CMS). Hospital outpatient quality reporting specifications manual, version 11.0. Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); Effective 2018 Jan. various p.

Fitch K, Pyenson B. Cancer patients receiving chemotherapy: opportunities for better management. Seattle (WA): Milliman, Inc.; 2010 Mar 30. 27 p. [20 references]

Guillory K, Sockdale H. Lifeline: why cancer patients depend on Medicare for critical coverage. Washington (DC): American Cancer Society Cancer Action Network; 2013 Jan 1. 19 p.

Hassett MJ, O'Malley AJ, Pakes JR, Newhouse JP, Earle CC. Frequency and cost of chemotherapy-related serious adverse effects in a population sample of women with breast cancer. J Natl Cancer Inst. 2006 Aug 16;98(16):1108-17. PubMed

Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (CORE), Mathematica Policy Research. Admissions and emergency department visits for patients receiving outpatient chemotherapy: measure technical report. Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); 2016 Mar. 58 p.

Primary Health Components

Cancer; outpatient chemotherapy; anemia; dehydration; diarrhea; emesis; fever; nausea; neutropenia; pain; pneumonia; sepsis; inpatient admissions; emergency department (ED) visits

Denominator Description

The measure cohort includes Medicare fee-for-service (FFS) patients, aged 18 years and older at the start of the performance period, with a diagnosis of any cancer (except leukemia), who received at least one outpatient chemotherapy treatment at the reporting hospital outpatient department (HOPD) during the performance period.

See the related "Denominator Inclusions/Exclusions" field.

Numerator Description

The outcomes for this measure are one or more inpatient admission, and one or more emergency department (ED) visit without an admission, for one of the following diagnoses—anemia, dehydration, diarrhea, emesis, fever, nausea, neutropenia, pain, pneumonia, or sepsis—within 30 days of receiving hospital-based outpatient chemotherapy treatment for cancer.

See the related "Numerator Inclusions/Exclusions" field.

Note: The chemotherapy measure is a risk-adjusted outcome measure and does not have a traditional numerator like a process measure; thus the developer uses this field to define the outcomes of interest as this measure separately reports hospital rates of two outcomes: admission and ED visits. See the original measure documentation and the *Admissions and Emergency Department Visits for Patients Receiving Outpatient Chemotherapy: Measure Technical Report* for more details (see the "Companion Documents" field).

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

- Cancer care is a priority area for outcomes measurement because cancer is an increasingly prevalent condition associated with considerable morbidity, mortality, and healthcare spending. In 2015, there were more than 1.6 million new cases of cancer in the United States (American Cancer Society, 2015). Each year, approximately 22 percent of patients with cancer receive chemotherapy (Klodziej et al., 2011). Unscheduled emergency department (ED) visits and hospital admissions are significant sources of utilization and cost among this population; on average, cancer patients receiving chemotherapy have one hospital admission and two ED visits per year. Approximately 40 percent of those admissions and 50 percent of those ED visits stem from complications of chemotherapy (Klodziej et al., 2011).
- Recent studies of cancer outpatients show that the most commonly cited symptoms and reasons for hospital visits are pain, anemia, fatigue, nausea and/or vomiting, fever and/or febrile neutropenia, shortness of breath, dehydration, diarrhea, and anxiety/depression (Hassett et al., 2006). These predictable complications affect patients' quality of life and pose a heavy financial burden; using commercial claims data, Fitch and Pyenson (2010) reported that the national average cost of a chemotherapy-related admission was $22,000, and the average cost of a chemotherapy-related ED visit was $800. In addition, Medicare payments for cancer treatment totaled $34.4 billion in 2011, representing almost 10 percent of Medicare fee-for-service (FFS) spending (Guillory & Sockdale, 2013).

Evidence for Additional Information Supporting Need for the Measure

American Cancer Society (ACS). Cancer facts & figures 2015. Atlanta (GA): American Cancer Society (ACS); 2015. 56 p. [54 references]

Fitch K, Pyenson B. Cancer patients receiving chemotherapy: opportunities for better management. Seattle (WA): Milliman, Inc.; 2010 Mar 30. 27 p. [20 references]

Guillory K, Sockdale H. Lifeline: why cancer patients depend on Medicare for critical coverage. Washington (DC): American Cancer Society Cancer Action Network; 2013 Jan 1. 19 p.

Hassett MJ, O'Malley AJ, Pakes JR, Newhouse JP, Earle CC. Frequency and cost of chemotherapy-related serious adverse effects in a population sample of women with breast cancer. J Natl Cancer Inst. 2006 Aug 16;98(16):1108-17. PubMed

Kolodziej M, Hoverman JR, Garey JS, Espirito J, Sheth S, Ginsburg A, Neubauer MA, Patt D, Brooks B, White C, Sitarik M, Anderson R, Beveridge R. Benchmarks for value in cancer care: an analysis of a large commercial population. J Oncol Pract. 2011 Sep;7(5):301-6. PubMed

Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (CORE), Mathematica Policy Research. Admissions and emergency department visits for patients receiving outpatient chemotherapy: measure technical report. Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); 2016 Mar. 58 p.

Extent of Measure Testing

The Centers for Medicare & Medicaid Services (CMS) tested the measure using the National Quality Forum (NQF) criteria for scientific soundness and importance, including testing the risk-adjustment model, assessing sociodemographic status (SDS) risk factors, and evaluating the measure score variation in development and validation split samples. The measure testing aligns with national guidelines for publicly reported outcomes measures and with the technical approach to outcomes measurement set forth in NQF guidance for outcomes measures (2011), CMS Measure Management System (MMS) guidance (2016), and the guidance in the American Heart Association scientific statement "Standards for Statistical Models Used for Public Reporting of Health Outcomes" (Krumholz et al., 2006). The model showed good fit and discrimination across risk groups and the two hospital types (Prospective Payment System-exempt cancer hospital [PCH] and non-PCH). For summarizing the results from testing, CMS calculated each risk-adjustment model (for hospital visits and emergency department [ED] visits) among all hospitals, and presented overall and stratified results by hospital type (PCH and non-PCH). During testing, CMS estimated the measure score for hospitals using Medicare fee-for-service (FFS) claims with a performance period of July 1, 2012, to June 30, 2013, and calculated results for all hospitals, PCHs, and non-PCHs. Across all hospital types, the risk-standardized inpatient admission rate (RSAR) ranged from 6.0 to 24.9 percent. The risk-standardized ED visit rate (RSEDR) ranged from 2.1 to 7.5 percent.

Evidence for Extent of Measure Testing

Centers for Medicare and Medicaid Services (CMS). Measures system overview. [internet]. Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); [accessed 2016 Jan 01].

Krumholz HM, Brindis RG, Brush JE, Cohen DJ, Epstein AJ, Furie K, Howard G, Peterson ED, Rathore SS, Smith SC Jr, Spertus JA, Wang Y, Normand SL, American Heart Association, Quality of Care and Outcomes Research Interdisciplinary Writing Group, Council on Epidemiology and Prevention; Stroke Council, American College of Cardiology Foundation. Standards for statistical models used for public reporting of health outcomes: an American Heart Association Scientific Statement from the Quality of Care and Outcomes Research Interdisciplinary Writing Group: cosponsored by the Council on Epidemiology and Prevention and the Stroke Council. Endorsed by the American College of Cardiology Foundation. Circulation. 2006 Jan 24;113(3):456-62. PubMed

National Quality Forum (NQF). National voluntary consensus standards for patient outcomes 2009: a consensus report. Washington (DC): National Quality Forum (NQF); 2011. 224 p.

Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (CORE), Mathematica Policy Research. Admissions and emergency department visits for patients receiving outpatient chemotherapy: measure technical report. Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); 2016 Mar. 58 p.

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Emergency Department

Hospital Inpatient

Hospital Outpatient

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Single Health Care Delivery or Public Health Organizations

Statement of Acceptable Minimum Sample Size

Does not apply to this measure

Target Population Age

Age greater than or equal to 18 years

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Priority

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Not within an IOM Care Need

IOM Domain

Not within an IOM Domain

Data Collection for the Measure

Case Finding Period

Encounter dates: January 1 through December 31

Denominator Sampling Frame

Enrollees or beneficiaries

Denominator (Index) Event or Characteristic

Clinical Condition

Encounter

Patient/Individual (Consumer) Characteristic

Therapeutic Intervention

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions
The measure cohort includes Medicare fee-for-service (FFS) patients, aged 18 years and older at the start of the performance period, with a diagnosis of any cancer (except leukemia), who received at least one outpatient chemotherapy treatment at the reporting hospital outpatient department (HOPD) during the performance period.

Note: Refer to the QualityNet Web site for a revised list of the International Classification of Diseases, Ninth Revision (ICD-9) and International Classification of Diseases, Tenth Revision (ICD-10) Procedural Terminology (CPT®), and Healthcare Common Procedure Coding System (HCPCS) codes to identify cancer diagnoses and chemotherapy treatments (see also the "Companion Documents" field).

Exclusions
The measure excludes the following patients from the cohort:

Patients with a diagnosis of leukemia at any time during the performance period;
Patients who were not enrolled in Medicare FFS Parts A and B in the year prior to the first outpatient chemotherapy treatment during the performance period; and
Patients who do not have at least one outpatient chemotherapy treatment followed by continuous enrollment in Medicare FFS Parts A and B in the 30 days after the procedure.

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions
The outcomes for this measure are one or more inpatient admission, and one or more emergency department (ED) visit without an admission, for one of the following diagnoses—anemia, dehydration, diarrhea, emesis, fever, nausea, neutropenia, pain, pneumonia, or sepsis—within 30 days of receiving hospital-based outpatient chemotherapy treatment for cancer.

Note:

Refer to the QualityNet Web site for a revised list of the International Classification of Diseases, Ninth Revision (ICD-9) and International Classification of Diseases, Tenth Revision (ICD-10) codes that identify these diagnoses (see also the "Companion Documents" field).
The chemotherapy measure is a risk-adjusted outcome measure and does not have a traditional numerator like a process measure; thus the developer uses this field to define the outcomes of interest as this measure separately reports hospital rates of two outcomes: admission and ED visits. The qualifying diagnosis on the admission or ED visit claim must be (1) the principal diagnosis or (2) a secondary diagnosis accompanied by a principal diagnosis of cancer. Outcomes are identified separately for the inpatient and ED categories; a patient can only qualify for an outcome in either category, but not both. Patients who experience both an inpatient admission and an ED visit during the performance period are counted towards the inpatient admission outcome. Among those with no qualifying inpatient admissions, qualifying ED visits will be counted.
The measure calculates a hospital-specific risk-adjusted rate for each of the two outcomes. Each rate is calculated as the ratio of a hospital's "predicted" number of outcomes to "expected" number of outcomes multiplied by the national observed outcome rate. If a hospital's ratio of predicted to expected outcomes is less than 1, it indicates that the hospital is performing better than expected given its case mix. If a hospital's ratio of predicted to expected outcomes is greater than 1, it indicates that the hospital is performing worse than expected given its case mix. For ease of interpretation, the Centers for Medicare & Medicaid Services transforms this ratio to a rate by multiplying by the national observed rate for that outcome. If the "predicted" number of outcomes is higher (or lower) than the "expected" number of outcomes for a given hospital, the risk-adjusted rate will be higher (or lower) than the national observed admission rate. See the original measure documentation and the *Admissions and Emergency Department Visits for Patients Receiving Outpatient Chemotherapy: Measure Technical Report* for more details (see the "Companion Documents" field).

Exclusions
None

Numerator Search Strategy

Fixed time period or point in time

Data Source

Administrative clinical data

Type of Health State

Proxy for Outcome

Instruments Used and/or Associated with the Measure

Unspecified

Computation of the Measure

Measure Specifies Disaggregation

Measure is disaggregated into categories based on different definitions of the denominator and/or numerator

Basis for Disaggregation

Data Reported As: The data are reported as two separate rates among cancer patients with a hospital-based outpatient chemotherapy treatment: (1) a facility-level, risk-standardized rate of inpatient admissions within 30 days, and (2) a facility-level, risk-standardized rate of emergency department (ED) visits within 30 days.

Scoring

Rate/Proportion

Ratio

Interpretation of Score

Desired value is a lower score

Allowance for Patient or Population Factors

not defined yet

Description of Allowance for Patient or Population Factors

Since the measure has two mutually exclusive outcomes—qualifying inpatient admissions and qualifying emergency department (ED) visits—it has two risk-adjustment models, one for each dependent variable (inpatient admissions and ED visits). A two-level hierarchical logistic regression model is used to estimate risk-standardized outcome rates. This approach accounts for differences in patient mix, the clustering of patients within hospitals, and variation in sample size.

The measure adjusts for variables that are clinically relevant and associated with the outcome. It seeks to adjust for differences in patient demographics, clinical comorbidities, and treatment exposure (that is, the number of chemotherapy treatments undergone by the patient in the hospital outpatient setting during the performance period), which vary across patient populations and influence the outcome but do not relate to quality. Specifically, the risk-adjustment model for inpatient admissions has 20 patient-level variables (age, sex, exposure, nine comorbidity variables, and eight cancer categories). The risk-adjustment model for ED visits has 15 patient-level variables (age, sex, exposure, six comorbidity variables, and six cancer categories).

Patient-Level Risk-Adjustment Variables

Category	Inpatient Admission Outcome	ED Visit Outcome
Demographics	Age (years above 18, continuous) Sex	Age (years above 18, continuous) Sex

Exposure Category	Inpatient Admission Outcome	ED Visit Outcome
	Number of hospital outpatient chemotherapy treatments during the performance period	Number of hospital outpatient chemotherapy treatments during the performance period
Cancer type	Breast cancer Digestive cancer Respiratory cancer Lymphoma Other cancer Prostate cancer Secondary cancer of the lymph nodes Secondary cancer of solid tumor	Breast cancer Digestive cancer Respiratory cancer Other cancer Secondary cancer of the lymph nodes Secondary cancer of solid tumor
Comorbidities	Respiratory disorder Renal disease Diabetes Other injuries Metabolic disorder Gastrointestinal disorder Psychiatric disorder Neurological condition Cardiovascular disease	Respiratory disorder Other injuries Gastrointestinal disorder Psychiatric disorder Neurological condition Cardiovascular disease

The Condition Categories (CCs) that define each of these comorbidities and the International Classification of Diseases, Ninth Revision (ICD-9) and International Classification of Diseases, Tenth Revision (ICD-10) codes that define the cancer categories are included in Appendix A of the original measure documentation. The comorbidities are based on version 22 of the Centers for Medicare & Medicaid Services (CMS) CC groups. Full details of the development of the risk-adjustment model for this measure from the CMS Web site .

Standard of Comparison

not defined yet

Identifying Information

Original Title

OP-35: CMS outcome measures (claims-based): admissions and emergency department (ED) visits for patients receiving outpatient chemotherapy.

Measure Collection Name

Hospital Outpatient Quality Measures

Measure Set Name

Outpatient Chemotherapy

Submitter

Centers for Medicare & Medicaid Services - Federal Government Agency [U.S.]

Developer

Centers for Medicare & Medicaid Services - Federal Government Agency [U.S.]

Funding Source(s)

United States Department of Health and Human Services

Composition of the Group that Developed the Measure

This measure was developed by a team of clinical and statistical experts from Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (YNHHSC/CORE), under contract to the Centers for Medicare & Medicaid Services (CMS).

Financial Disclosures/Other Potential Conflicts of Interest

Unspecified

Core Quality Measures

Does not apply to this measure

Measure Initiative(s)

Hospital Outpatient Quality Reporting Program

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2018 Jan

Measure Maintenance

Annual

Date of Next Anticipated Revision

Unspecified

Measure Status

This is the current release of the measure.

Measure Availability

Source available from the QualityNet Web site .

Check the QualityNet Web site regularly for the most recent version of the specifications manual and for the applicable dates of discharge.

Companion Documents

The following are available:

Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (CORE), Mathematica Policy Research. Admissions and emergency department visits for patients receiving outpatient chemotherapy: measure technical report. Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); 2016 Mar. 58 p. Available from the QualityNet Web site .

Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (CORE), Mathematica Policy Research. Revised chemotherapy measure code set. Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); 2017 Aug 14. Available from the QualityNet Web site .

NQMC Status

This NQMC summary was completed by ECRI Institute on February 22, 2018. The information was verified by the measure developer on May 3, 2018.

Copyright Statement

Production

Source(s)

Centers for Medicare and Medicaid Services (CMS). Hospital outpatient quality reporting specifications manual, version 11.0. Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); Effective 2018 Jan. various p.

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